

Observations on Feeding and Prey Specificity of *Tritonia festiva* (Stearns) with Comments on other Tritoniids

(Mollusca : Opisthobranchia)

BY

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(1 Plate)

Tritonia festiva (Stearns, 1873) has been reported to occur from the Coronados Islands, Mexico to Vancouver Island, Canada (LANCE, 1961) and also in Japan (THOMPSON, 1971). On numerous occasions I have encountered this species off La Jolla, California, principally at about 30m depth on the north rim of the Scripps Branch of the La Jolla submarine canyon and at 20m depth on an artificial reef about 1.6km to the north. On almost every occasion I have found the nudibranch on the pink gorgonian, *Lophogorgia chilensis* (Verrill, 1868) (see Plate).

My research on the barnacle *Balanus galeatus* (Linnaeus, 1771), which is commensal on gorgonians (MOLENOCK & GOMEZ, 1972) led me to investigate the role that the nudibranch might play in the ecology of the cirriped. The cyprid larva of the barnacle attaches itself on the exposed axial skeleton of the gorgonian. Since some nudibranchs are known predators of alcyonarians (THOMPSON, 1964), I set out to determine if *Tritonia festiva* fed on *Lophogorgia*.

On one occasion I brought back to the laboratory 2 specimens of the nudibranch. On examination I observed the gut to appear deep pink through the translucent body. Upon dissection the gut yielded spicules of the coelenterate. Subsequently, the fecal pellets of the second specimen also yielded spicules. Here was direct evidence that *Tritonia festiva* fed on *Lophogorgia chilensis*.

I was next interested to verify if the nudibranch actually exposed the axis of the gorgonian in its feeding or whether it merely browsed the surface of the coenenchyme. I subsequently brought up from the field some gorgonian branches and several other nudibranchs and placed them on the laboratory sea table.

On the next day I observed one nudibranch 30mm long crawling on an upraised branch of *Lophogorgia*, seeming to feel its way with its cephalic tentacles. It continued distally until it reached the branch termination, where-

upon it spread the oral veil over the tip which became engulfed within the pharynx. With a single bite, a 2mm length of the tip was trimmed off. It passed this piece into its stomach and appeared to rest for a few minutes, after which the oral veil was again placed over the cut tip. This time the nudibranch was not able to break off the entire tip since the gorgonian axis is stouter here. Half the "rind" of the branch was stripped, leaving about 2mm of the axial skeleton exposed. When the feeding process was over half an hour later, about 4mm of the axis of the gorgonian had been denuded of coenenchyme.

I observed one other *Tritonia* feed on *Lophogorgia* in the laboratory. Although I have not actually witnessed this feeding process in the field, I have on numerous occasions seen exposed axes on branch tips of the gorgonian. There is little doubt that some of these were feeding sites of the nudibranch. It is on these denuded tips that settling cyprid larvae attach, as borne out by the fact that more often than not, adult barnacles on *Lophogorgia* are located terminally on the branches. Along with other physical and biological agents, *Tritonia festiva* thus serves to prepare a substrate for the settlement of the barnacle on the gorgonian (see Plate).

Since gorgonians become scarce as one proceeds north along the coast, I was puzzled to learn that *Tritonia festiva* was not uncommon in Puget Sound. Either the reports were inaccurate or the nudibranch fed on other prey. A letter from Dr. Charles Birkeland, who had studied the predators of the sea pen *Ptilosarcus guerneyi* (Gray) in Washington (doctoral dissertation, University of Washington, 1970) provided me with the answer. I learned that *T. festiva* feeds on this sea pen in Puget Sound.

This nudibranch is not therefore limited to a single prey species. A parallel case is that of *Tritonia plebeia* (Johnston, 1828). THOMPSON (1964) lists its diet to include the alcyonacean *Alcyonium digitatum* and the gorgonian

Eunicella verrucosa. A recent paper (WICKSTEN & DEMARTINI, 1973) reports that the tritoniid *Tochuina tetraquetra* (Pallas, 1788) feeds on *Gersemia rubiformis* in Trinidad Bay, California. As no mention is made of other prey species, one might conclude that it feeds exclusively on *Gersemia*. While this may be true for Trinidad Bay, THOMPSON (1971) mentions that it feeds on *Ptilosarcus* in Washington, while MACFARLAND (1966) had noted spicules, presumably gorgonian in origin, in the gut of *Tochuina*.

In the feeding experiments of Wicksten and DeMartini, they offered the nudibranch cnidarians that were found in its habitat (Wicksten, personal communication). I would like to note that the 3 species rejected by the tritoniid nudibranch were zoantharians or hexacorals. A survey of the literature reveals that the members of the family Tritoniidae prey almost exclusively on the subclass Alcyonaria (= Octocorallia). The data available are given in Table 1.

THOMPSON (1964), who reviews the diet of the British nudibranchs, has some reservations about hydroids being included among the prey of *Tritonia plebeia*. Whether oysters are actively sought by the large British nudibranch *T. hombergi* or whether they are ingested only incidentally is an interesting question. If they are digested when passed through the gut, they would represent the only known prey species outside the phylum Coelenterata. Indeed, the tritoniid nudibranchs appear to limit themselves to the

alcyonarian orders Stolonifera, Alcyonacea, Gorgonacea, and Pennatulacea.

Data are accumulating indicating that species of the family Tritoniidae are not strictly prey specific, but that their diet varies from region to region. In a given locality, however, a population may be limited to a single prey species.

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Table 1

Prey Species of the Tritoniidae

Predator	Prey	Source
<i>Tritonia exsulans</i> Bergh, 1894	Sea pen	MARCUS, 1961
<i>Tritonia hombergi</i> Cuvier, 1803	<i>Alcyonium digitatum</i> ; oysters	THOMPSON, 1962 THOMPSON, 1964
<i>Duvaucelia odhneri</i> Tardy, 1963	<i>Eunicella verrucosa</i> (Pallas)	TARDY, 1963
<i>Tritonia lineata</i> (Alder & Hancock, 1846)	Alcyonarians	THOMPSON, 1964
<i>Tritonia plebeia</i> (Johnston, 1838)	<i>A. digitatum</i> , <i>E. verrucosa</i> , hydroids	THOMPSON, 1964
<i>Tochuina tetraquetra</i> (Pallas, 1788)	Alcyonarian (<i>Euplexaura marki</i> ?) <i>Ptilosarcus guerneyi</i> <i>Gersemia rubiformis</i> (Pallas)	MACFARLAND, 1966 THOMPSON, 1971 WICKSTEN & DEMARTINI, 1973
<i>Tritonia diomedea</i> (Bergh, 1894)	<i>Virgularia</i> sp.	THOMPSON, 1971
<i>Tritonia pickensi</i> Marcus & Marcus, 1967	Gorgonian (implied)	KEEN, 1971
<i>Tritonia wellsi</i> Marcus, 1961	<i>Leptogorgia virgulata</i> (Lamarck)	PATTON, 1972
<i>Tritonia bayeri</i> Marcus & Marcus, 1967	<i>Briareum asbestinum</i> <i>Pseudopterogorgia</i> sp.	SALVINI-PLAWEN, 1972
<i>Tritonia manicata</i> Deshayes, 1839	<i>Cornularia</i> sp.	SALVINI-PLAWEN, 1972
<i>Tritonia striata</i> Haefelfinger, 1963	<i>Paralcyonium elegans</i>	SALVINI-PLAWEN, 1972
<i>Tritonia festiva</i> (Stearns, 1873)	<i>Ptilosarcus guerneyi</i> (Gray) <i>Lophogorgia chilensis</i> (Verrill)	Birkeland, pers. comm. Gomez, personal observations



Figure 1

Tritonia festiva on *Lophogorgia chilensis*

The nudibranch is attached to a branch on which it has just fed. Note injured branch tip and exposed axis of the gorgonian at top center. Gall-like expansions on the gorgonian at center background and at extreme left branch terminus are the barnacle, *Balanus galeatus*. White polyps of the gorgonian are expanded at left, retracted elsewhere. Underwater Kodachrome (from which this black-and-white print was made) through the courtesy of Chuck Nicklin, Diving Locker, San Diego.